

Appl. No. 10/061,550
Amdt. Dated March 8, 2005
Reply to Office action of November 10, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A surface acoustic wave device including a transducer electrode formed on a substrate, the electrode having a plurality of layers, and at least one of the layers being metal that has a propensity to migrate, another of the layers toward which the metal would migrate, and yet another of the layers being a material for providing a hardening effect to the metal layer to inhibit the migration of the metal.

2. (original) A surface acoustic wave device as set forth in claim 1, wherein the material is a metal and oxygen compound.

3. (original) A surface acoustic wave device as set forth in claim 2, wherein the metal and oxygen compound includes aluminum.

4. (original) A surface acoustic wave device as set forth in claim 3, wherein the metal and oxygen compound is aluminum oxide.

5. (original) A surface acoustic wave device as set forth in claim 1, wherein the metal of the material includes aluminum.

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6. (original) A surface acoustic wave device as set forth in claim 1, wherein the substrate is planar, each of the layers having a portion extending parallel to the substrate, the parallel extending portions being vertically stacked relative to the substrate, at least some of the layers also having portions extending transversely to the substrate, and the transverse extending portions being laterally stacked relative to the substrate.

7. (previously presented) A surface acoustic wave device as set forth in claim 6, wherein the second layer of hardening material has a portion extending laterally about the layer of metal for preventing migration of the metal.

8. (original) A surface acoustic wave device as set forth in claim 6, wherein the transverse portions do not extend onto the substrate beyond the electrode.

9. (original) A surface acoustic wave devices as set forth in claim 6, wherein the material is a metal and oxygen compound.

10. (original) A surface acoustic wave device as set forth in claim 9, wherein the metal and oxygen compound includes aluminum.

11. (original) A surface acoustic wave device as set forth in claim 10, wherein the metal and oxygen compound is aluminum oxide.

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12. (original) A surface acoustic wave device as set forth in claim 6, wherein the metal of the material includes aluminum.

13. (original) A surface acoustic wave device as set forth in claim 1, wherein the transducer electrode is electrically connected to a metal component that permits electrical connection of the surface acoustic wave device to an electrical device external to the surface acoustic wave device, the electrode having a metal portion of a first metallization, and the component being of a second, different metallization.

14. (previously presented) A surface acoustic wave device as set forth in claim 13, wherein the component includes one of a bus bar and a bond pad.

15. (original) A surface acoustic wave device as set forth in claim 13, wherein the first metallization includes the metal portion of the electrode being made of a first metal, and the second metallization includes the component being made of a second, different metal.

16. (original) A surface acoustic wave device as set forth in claim 13, wherein the first metallization includes the metal portion of the electrode having a first thickness, and the second metallization includes the component having a second, different thickness.

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17. (previously presented) A surface acoustic wave device including a transducer electrode formed on a substrate, the electrode having a plurality of layers, and at least one of the layers being metal that has a propensity to migrate, another of the layers toward which the metal would migrate, and yet another of the layers being a metal and oxygen compound to inhibit the migration of the metal.

18. (original) A surface acoustic wave device as set forth in claim 17, wherein the metal and oxygen compound includes aluminum.

19. (original) A surface acoustic wave device as set forth in claim 18, wherein the metal and oxygen compound is aluminum oxide.

20. (previously presented) A method of making a surface acoustic wave device, the method including the steps of:
 providing a substrate; and
 creating a transducer electrode having a plurality of layers on the substrate, including creating a metal layer that has a propensity to migrate, creating another of the layers toward which the metal would migrate, and creating a layer of a material that provides a hardening effect to the metal layer to inhibit the migration of the metal.

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21. (original) A method of making a surface acoustic wave device as set forth in claim 20, wherein the step of creating a layer of a material includes creating the layer of material as a metal and oxygen compound layer.

22. (original) A method of making a surface acoustic wave device as set forth in claim 20, wherein the step of creating a transducer electrode includes metal lift-off processing.

23. (currently amended) A surface acoustic wave device including a transducer electrode electrically connected to a metal component that permits electrical connection of the surface acoustic wave device to an electrical device external to the surface acoustic wave device, the electrode having a metal portion layer of a first metallization, and the component being a layer of a second, different metallization, wherein the electrode has a plurality of layers, and at least one of the layers being metal and another of the layers being a material for providing a hardening effect to the metal layer.

24. (original) A surface acoustic wave device as set forth in claim 23, wherein the component includes one of a bus bar and a bond pad.

25. (original) A surface acoustic wave device as set forth in claim 23, wherein the first metallization includes the metal portion of the electrode being made

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of a first metal, and the second metallization includes the component being made of a second, different metal.

26. (original) A surface acoustic wave device as set forth in claim 23, wherein the first metallization includes the metal portion of the electrode having a first thickness, and the second metallization includes the component having a second, different thickness.

27. (cancelled)

28. (currently amended) A surface acoustic wave device as set forth in claim [27] 23, wherein the material is a metal and oxygen compound.

29. (original) A surface acoustic wave device as set forth in claim 28, wherein the metal and oxygen compound includes aluminum.

30. (original) A surface acoustic wave device as set forth in claim 29, wherein the metal and oxygen compound is aluminum oxide.

31. (currently amended) A surface acoustic wave device as set forth in claim [27] 23, wherein the metal of the material includes aluminum.

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32. (currently amended) A surface acoustic wave device as set forth in claim [27] 23, wherein the substrate is planar, each of the layers having a portion extending parallel to the substrate, the parallel extending portions being vertically stacked relative to the substrate, at least some of the layers also having portions extending transverse to the substrate, and the transverse extending portions being laterally stacked relative to the substrate.

33. (original) A surface acoustic wave device as set forth in claim 32, wherein the second layer, of hardening material, has a portion extending laterally about the first layer, of metal, for preventing migration of the metal.

34. (original) A surface acoustic wave device as set forth in claim 32, wherein the transverse portions do not extend onto the substrate beyond the electrode.

35. (original) A surface acoustic wave device as set forth in claim 32, wherein the material is a metal and oxygen compound.

36. (original) A surface acoustic wave device as set forth in claim 35, wherein the metal and oxygen compound includes aluminum.

37. (original) A surface acoustic wave device as set forth in claim 36, wherein the metal and oxygen compound is aluminum oxide.

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38. (original) A surface acoustic wave device as set forth in claim 32, wherein the metal of the material includes aluminum.

39. (previously presented) A surface acoustic wave device including a transducer electrode electrically connected to a component that permits electrical connection of the surface acoustic wave device to an electrical device external to the surface acoustic wave device, the electrode having a metal portion layer made of a first metal, and the component being a layer made of a second, different metal.

40. (canceled).

41. (previously presented) A method of making a surface acoustic wave device, the method including the steps of:
making a transducer electrode, including making the electrode to have a metal portion layer of a first metallization; and
making a metal component, electrically connected to the electrode, that permits electrical connection of the surface acoustic wave device to an electrical device external to the surface acoustic wave device, including making the component having a layer of a second, different metallization.

42. (original) A method of making a surface acoustic wave device as set forth in claim 41, wherein the steps of making a transducer electrode and making a metal component include metal lift-off processing.